In the same way, the 9th partial was proved to exist, though the beat was still faint. The beats for the 10th partial (flattening e''') were better.

On sharpening f''', the beats of the 11th partial were just sensible. They lasted such an extremely short time that they were recognised with difficulty. It therefore did not seem worth while to try further.

These experiments conclusively proved the existence of the 5th, 6th, 7th, 8th, 9th, 10th, and 11th partials on a pianoforte string struck with a pianoforte hammer at one-eighth of its length, and that the 7th was comparatively powerful, while the 8th and 9th, though faint, were distinct. The node of the 7th was 0·8 inch from the striking place, and that of the 9th was 0·6 inch, so that the 9th was more affected than the 7th, but the 10th was 1·1 inch from the striking place, and hence probably was less affected than the 9th. The curious point is that the 8th partial was most decidedly not destroyed.

These experiments were all witnessed by Mr. A. J. Ellis, and one of Messrs. Broadwood's principal tuners, Mr. Pryer, who altered the pitch of the strings as required.

January 22, 1885.

THE TREASURER in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "Observations on the Chromatology of Actiniæ." By C. A. MacMunn, M.A., M.D. Communicated by Professor M. Foster, Sec. R.S. Received January 8, 1885.

(Abstract).

In this paper I have given the results of an examination of the following Actiniæ, mainly with regard to the spectroscopy of their colouring matters, viz., *Actinia mesembryanthemum*, *Bunodes crassicornis*, *Bunodes ballii*, *Sagartia bellis*, *Sagartia dianthus*, *Sagartia parasitica*, *Sagartia viduata*, *Sagartia troglodytes*, and *Anthea cereus*.

The previous work of Moseley, Krukenberg, Geddes, the Hertwigs, Brandt, and Heider, is first referred to.

The presence of a colouring matter in *Actinia mesembryanthemum*, which can be changed into alkaline hæmatin, hæmochromogen, and acid and alkaline hæmatoporphyrin is proved by appropriate tests, hence this Actinia contains a pigment nearly related to hæmoglobin. The same colouring matter has been found in *Bunodes crassicornis*, *Sagartia dianthus* (in small amount), *Sagartia viduata* (traces), and a closely connected pigment in *Sagartia troglodytes*, both in ectoderm and endoderm.

Another colouring matter is found which is special to this species in *Sagartia parasitica;* it is capable of existing in the oxidised and reduced state, and is found in the ectoderm, while in the interior of the animal a pigment changeable into hæmochromogen was detected; the spectroscopic characters of the former are described in detail.

In the mesoderm and elsewhere in *Actinia mesembryanthemum* and in *Bunodes crassicornis*, a green pigment occurs which is undistinguishable from biliverdin. It gives the same play of colours (in solution) with nitric acid, and the same changes of spectra which accompany the colour changes with that reagent in the case of biliverdin from the bile of vertebrates. The presence of a chlorophyll-like spectrum has been detected in the tentacles of *Bunodes ballii* and *Sagartia bellis*, as well as in *Anthea cereus* (in which last it had been previously detected by former observers), and this spectrum has been found to belong to the "yellow cells" which are found abundantly in the tentacles and elsewhere in these species. The various solutions of this colouring matter give the same spectra in all three. Professor Lankester's and Mr. Sorby's statement that this spectrum is similar to chlorofucin has been verified by a comparison with a solution of chlorofucin from *Fucus serratus.*

This colouring matter has been shown—contrary to the opinion expressed by Krukenberg—to be quite different from enterochlorophyll, also from plant chlorophyll, and other animal chlorophylls.

In every case the "yellow cells" are proved to have a cellulose wall, and to contain starch.

There are various new facts ascertained which cannot be explained by means of a short abstract.

The conclusions arrived at may in part be summed up as follows:—

(1.) *Actinia mesembryanthemum* contains a colouring matter which can be changed into hæmochromogen and hæmatoporphyrin, this is present in the other species mentioned above, and from its characters it is provisionally named *Actiniohæmatin.*

(2.) It is not actiniochrome (a pigment found by Professor Moseley in the tentacles of *Bunodes crassicornis*), as its band occurs nearer the violet than that of actiniochrome. Moreover, both actiniochrome and actiniohæmatin can be extracted with glycerin, in which the latter is convertible into hæmochromogen, but the former remains unchanged.

Actiniochrome is generally confined to the tentacles, and is not respiratory, actiniohæmatin occurs in the ectoderm and endoderm, and is respiratory.

(3.) A special colouring matter is found in *Sagartia parasitica*, different from either of the above, and this too exists in different states of oxidation. It is not apparently identical with that obtained by Heider from *Cerianthus membranaceus*.

(4.) In the mesoderm and elsewhere in *Actinia mesembryanthemum* and other species, a green pigment occurs which alone and in solution gives all the reactions of biliverdin.

(5.) *Anthea cereus*, *Bunodes ballii*, and *Sagartia bellis*, yield to solvents a colouring matter resembling chlorofucin, and all the colouring matter, which in them shows this spectrum, is derived from the "yellow cells," which are abundantly present in their tentacles and elsewhere. It is not identical with any animal or plant chlorophyll, as is proved by adding reagents to its alcoholic solution.

(6.) When "yellow cells" are present, there appears to be a suppression of those colouring matters which in other species are of respiratory use.

All readings are reduced to wave-lengths, and the spectra described illustrated by means of sixty-five maps of spectra. The "yellow cells" are also drawn alone and stained with iodine in iodide of potassium, and with Schultze's fluid.

II. "On the Origin of the Proteids of the Chyle and the Transference of Food Materials from the Intestine into the Lacteals." By E. A. Schäfer, F.R.S. From the Physiological Laboratory, University College, London. Received January 12, 1885.

In consequence of the discovery that in many of the lower Metazoa the ingestion of food particles is the result of an amœboid activity of individual cells of the organism, and that digestion and assimilation may also occur within the protoplasm of cells thus endowed with amœboid activity, attention has of late been directed to the part which such cells may play in promoting absorption from the alimentary canal of Vertebrates.

It is well known that lymph-cells occur in large numbers in the mucous membrane of the intestine, which is everywhere beset with them; besides which they form the nodular masses of the solitary and agminated glands. It is also known that they are found extending between the columnar epithelium-cells which line the intestine, sometimes in considerable number. Since this is the case, and since,